

Claims

1. A proteinic or glycoproteinic inhibitor of cellulolytic, xylanolytic and/or β -glucanolytic enzymes.
2. Inhibitor as in claim 1, characterised in that said inhibitor inhibits cellulase, endoxylanase, β -glucanase, β -xylosidase, α -L-arabinofuranosidase and/or other cellulose, xylan, arabinoxylan or β -glucan degrading enzymes.
3. Inhibitor as in claim 1 or 2, characterised in that it is obtainable from plant material or fractions thereof.
4. Inhibitor as in claim 3, characterised in that said plant material is selected from the group consisting of cereals, cereal grains or cereal flours from wheat, durum wheat, rye, triticale, barley, sorghum, oats, maize or rice.
5. Inhibitor as in claim 1 or 2, characterised in that it is obtainable from micro-organisms or fractions thereof.
6. Inhibitor as in any of the claims 1-5, characterised in that it is a xylanase inhibitor.
7. Inhibitor as in claim 6, characterised in that it is a water-soluble species.
8. Inhibitor as in claim 7 having a marker whose amino acid sequence has more than 70% homology with SEQ ID No. 1 and/or SEQ ID No.2.
9. Inhibitor as in claim 8, characterised in that the marker is the N-terminal amino acid sequence of

the protein or glycoprotein.

10. Inhibitor as in claim 8 or 9 having a marker for which amino acid sequence has more than 85% homology with SEQ ID No. 1 and/or SEQ ID No.2.

11. Inhibitor as in claim 10, characterised in that the marker is the N-terminal amino acid sequence of the protein or glycoprotein.

12. Inhibitor as in claim 7, having a marker whose amino acid sequence is identical to SEQ ID No. 1 and/or SEQ ID No.2.

13. Inhibitor as in claim 12, characterised in that the marker is the N-terminal amino acid sequence of the protein or glycoprotein.

14. Inhibitor as in any of the claims 7 to 13, characterised in that said protein or glycoprotein is selected from the group comprising proteins or glycoproteins having a molecular weight typically between 40 kDa and 43 kDa, proteins or glycoproteins having a molecular weight typically 30 kDa and proteins or glycoproteins having a molecular weight of typically 10 kDa.

15. Inhibitor as in any of the claims 7 to 14, characterised in that said protein or glycoprotein typically a molecular weight between 40 kDa and 43 kDa and has a pI of greater than about 7.

16. Method for obtaining the inhibitor as in any of the claims 1 to 15 from possibly genetically modified micro-organisms, plants or plant materials, wherein said micro-organisms, plants or plant materials are subjected to one or more extraction and/or fractionation

steps.

17. Method for obtaining the inhibitor according to any of the claims 1 to 15, wherein micro-organisms, plants or plant materials are genetically modified by the introduction of a genetic material encoding said inhibitor into the micro-organisms, plants or plant materials.

18. Process for transforming micro-organisms, plants or plant materials, wherein the activity of the inhibitor according to any of the claims 1 to 15 is reduced.

19. Process according to claim 18, characterised in that the reduced activity of the inhibitor according to the invention is obtained by reduction of its expression.

20. Process according to claim 18 or 19, characterised in that the activity of the inhibitor is reduced by blocking the inhibitor function.

21. Process for transforming micro-organisms, plants or plant materials, wherein the activity of the inhibitor according to any of the claims 1 to 15 is increased.

22. Process according to claim 21, characterised in that increased activity of the inhibitor according to the invention is obtained by an increase of its expression.

23. Process according to claim 21 or 22, characterised in that the activity of the inhibitor is increased by activating the inhibitor function.

24. Micro-organisms, plants or plant

materials obtained by the method according to any of the preceding claims 17 to 23.

25. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants and/or the plant materials according to claim 24 for improving the malting of cereals such as barley, sorghum and wheat and/or the production of beer.

26. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving the production and/or quality of baked or extruded cereal products chosen among the group consisting of straight dough, sponge dough, Chorleywood bread, breakfast cereals, biscuits, pasta and noodles.

27. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving animal feedstuff efficiency.

28. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving the production of starch derived syrups, sorbitol, xylose and/or xylitol.

29. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant

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materials according to claim 24 for wheat gluten-starch separation and production.

30. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving maize processing.

31. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving plant disease resistance.

32. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving nutraceutical and/or pharmaceutical applications.

33. Use of the inhibitor according to any of the preceding claims 1 to 15 or obtained by the method of claim 16, the micro-organisms, the plants or the plant materials according to claim 24 for improving paper and pulp technologies.

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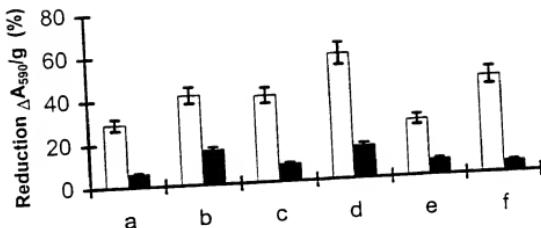


Fig. 1

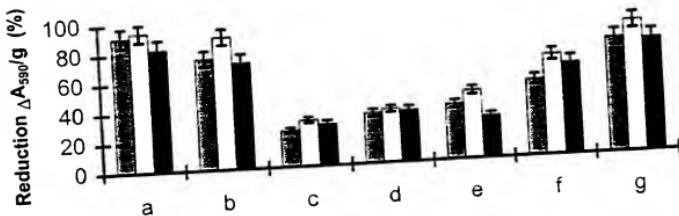


Fig. 2

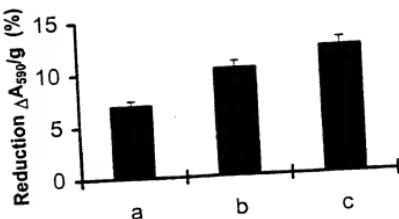


Fig. 3

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SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT:

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(ii) TITLE OF INVENTION: INHIBITORS OF CELLULOYTIC, KYLANOLYTIC AND
BETA-GLUCANOLYTIC ENZYMES

(iii) NUMBER OF SEQUENCES: 2

(iv) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30 (EPO)

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 14 amino acids
(B) TYPE: amino acid
(C) STRANDEDNESS: single
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified-site
(B) LOCATION: 12
(D) OTHER INFORMATION: /product= "preferably Asp"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

Lys Gly Leu Pro Val Leu Ala Pro Val Thr Lys Xaa Thr Ala
1 5 10

(2) INFORMATION FOR SEQ ID NO: 2:

(i) SEQUENCE CHARACTERISTICS:

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- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION:1
- (D) OTHER INFORMATION:/product= "Ser, Phe, or Gly"

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION:16
- (D) OTHER INFORMATION:/product= "Unidentified"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

Xaa Ala Pro Val Ala Lys Met Val Leu Pro Val Ala Met Lys Glu Xaa
1 5 10 15

Val